World Population Growth and Living Standards

by KUAN-I CHEN

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WORLD POPULATION GROWTH
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List of Publications

Facts on a Century of Agriculture, State-Regional-County, Agricultural Experiment Station Bulletin, No. 587, January 1955, Pennsylvania State University. (Published jointly with Jerome K. Pasto.)

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"One Hundred Ten Years of Agricultural Production in Pennsylvania." *Pennsylvania Farm Economics,* No. 49, April 1953. (Published jointly with Jerome K. Pasto.)

"Horse Tale." *Science for the Farmer,* Vol. II, No. 2, 1954. (Published jointly with Jerome K. Pasto.)

"Hong Kong's Fragile Future." *The New Leader,* December 7, 1959.

"Life in Communist China in the Year of Great Leap Forward." *International Peasant Union Bulletin,* January, 1960.

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by Kuan-I Chen

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Preface

Dependent and newly independent underdeveloped nations in Africa and Asia as well as the underdeveloped nations in Latin America are playing an increasing role in determining the outcome of the East-West struggle. Many of these so-called uncommitted nations are yearning for improved living standards. Programs for social and economic development have been established by government and private agencies in many of these nations. Such programs are vital to their national stability and, therefore, have a crucial bearing on the outcome of the East-West struggle. However, the success of these programs is already being jeopardized by the unprecedented growth of population in underdeveloped areas in recent years. Modern transportation and communication facilities will continue to reduce the world of the 1960's to a much smaller, more interdependent entity than ever before. Thus, far from being a national or regional problem, the population problem in underdeveloped areas will inevitably become a problem of the whole free world.

Almost the most important reason why rapid population growth should be considered a serious problem of the shrinking world is its adverse effect on living standards. This volume, therefore, aims to accomplish the following: (1) present a picture of the world population growth in the past and in the foreseeable future, with special attention to future population growth in the crucial areas; (2) show the existing great disparities in material well-being between the crucial areas and areas with highly developed economies; and (3) explain the impeding effect of rapid population growth on the efforts to raise the standard and level of living.

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I also wish to express my thanks to Mrs. Claire Mitchell who typed the draft as well as the final copy of the manuscript.

The author is, of course, alone responsible for any errors of fact, calculation, and interpretation in this volume.

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March 1960
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CHAPTER ONE

The Need for the Awareness of the Population Problem in a Shrinking World

Human history may be viewed as a record of the past activities of people in different parts of the world. All human affairs and activities involve the interactions of people in relation to their physical environment. In this sense, population is the raw material of all human affairs and activities.

Let us first have a very brief account of the change in world population in the recent past. During the past few decades world population has experienced an unprecedented growth both in absolute number and in the rate of increase. The world population increased from about 1,608 million inhabitants in 1900 to 2,495 million in mid-1950 and finally reached 2,852 million by mid-year of 1958. It is astonishing indeed to find that the increase of 357 million new inhabitants on earth just during the period 1950-58 is about 40 per cent greater than the combined population of Northern America[1] and Middle America[2] which had 256 million inhabitants in 1958. From mid-1957 to mid-1958 alone, world population increased by about 57 million which is without precedent and which is as great as the combined population of West Germany and Switzerland in 1958. Even the annual rate of growth has accelerated during the past decades of the present century. It has increased from less than 1.0 per cent per annum throughout the first five decades of this century to 1.7 per cent for the period 1950–1958.

Facts and figures such as those given above may only give us an impression of the rapid growth of world population without making us aware of the fact that such a phenomenal growth of population is actually a world problem of the first magnitude, and that a study of world population will offer one of the fundamental approaches to the understanding of world affairs. There are at least four reasons persuading us to take such a point of view.

First, population should not be viewed as merely a matter of numbers, nor should its effect on society be viewed as static. Population is in a continuous but ever changing process, and the impact of such process has a profound and dynamic effect upon the course of human activities and affairs, i.e., world history. The population problem is, in reality, the keystone to the understanding and analysis of society.

Second, the study of the impact of demographic change on society calls for more than a knowledge of the change in population alone. It requires an analysis and understanding of the other aspects of society. The change in demographic situations has great social, economic, and political effects. But these effects in turn impose profound demographic changes. Future world events will be affected greatly by the present rapid growth of world population since population is intimately involved with sociological, economic, political and cultural developments which determine the well-being, peace and security of the peoples of the world.

Third, modern transportation and communication facilities have reduced the world of the 1960's to a much smaller size than before. People at one corner of the world can now communicate and even see their fellow men at the opposite corner of the world. The prosperity and security of a nation are more or less related to those of other nations. The familiar terms such as "trade not aid,"

"peaceful coexistence," "collective security," "peaceful economic competition," etc., may serve to reflect this situation. Any significant social and technological revolution or turmoil in one area has its inevitable impact or repercussion elsewhere, in different degrees and with differing time lag. Thus any serious problem which affects one part of the world today can no longer be viewed with indifference in the belief that it would not affect the rest of the world. Without exception, the consequences of rapid population growth in some crucial areas of the world today tend to extend eventually to the rest of the shrinking, closely related world.

Lastly, not only is the world of the 1960's a smaller, more interdependent and interrelated one, it is also a world in ferment. The two-thirds of mankind who inhabit mainly Asia, Africa, and Latin America, where the rate of population increase has been very rapid, possess generally less wealth and power than those who mainly inhabit Europe and North America. They are awakening and becoming more and more conscious of their poverty, high rate of illiteracy, etc. Increasingly, people in these less developed lands desire to reduce the existing gap of material well-being between them and the more highly developed nations. However, the deep awareness of their poverty is not accompanied by the corresponding awareness of the fact that their goal and effort for economic development, as well as higher standard of living, will be either handicapped or overburdened by the unprecedented increase of population. An awareness of the serious consequences of rapid growth of population in various regions of the world will provide a useful background to the understanding of this world problem and its solution.

The objective of this volume is, therefore, to provide answers for the following questions:

1. What was the trend of world population growth before 1650?
2. What were the trends of population growth in the world regions between 1650 and 1957?
3. What are the future trends of population growth in the world regions?
4. Are there any great contrasts with respect to the rate of population growth and to population density among the world regions?
5. What conclusions can be drawn from those facts revealed in (4)?
6. Why did the world population increase so rapidly during the recent past, and why is it expected to increase with greater speed during the next few decades.
7. What are those crucial areas with problems of widening "demographic gap," and what are the roles played by those crucial areas in accelerating world population growth in the recent past and in the foreseeable future?
8. How great are the existing disparities in material well-being between the crucial areas and areas with highly developed economy?
9. How would rapid population growth impede the effort of nations in these crucial areas to raise their level of consumption?
10. Did food production win the race against population growth in recent years?
11. What would be the most realistic and farsighted approach to this overpopulation problem of the world of the 1960's?

CHAPTER TWO

The Estimates of World Population Increase in the Past

A. *The Growth of World Population before 1650*

Lack of reliable data makes estimates of the size of world population during any specified period in the past less accurate than those of the present time. Relatively reliable estimates and censuses of population are, as a matter of fact, rather recent phenomena and limited to countries such as the United States, Canada, Japan, Oceania, and most of Europe. For many countries of Asia, Africa, the Middle East, and Latin America the information still is either scanty or far from reliable. For example, various estimates of China's population may show a divergence of as many as 100 million people even in recent years. When the estimates are extended back to a period of three centuries, the shortage of reliable information grows more serious and the results tend to serve more as crude approximations rather than as reliable estimates. If we extend the estimates back to a few thousand years, inevitably the analysis is, at best, a good guess. In spite of such handicaps, the findings of prudent research conducted by various creditable scholars in this field can serve well as a background for the analysis of recent as well as future population trends.

According to Julian Huxley[3] during the early stage of mere food gathering, much earlier than 5500 B.C., the world population was probably about 5 million; the

lower limit was set at 2 million and the upper limit at 10 million. The size of population may have reached 10 million with 5 million as a lower limit around 5500 B.C. Since hunting was the highest form of economic endeavor of the day, whereas agriculture as well as domestication was soon to be but not yet practiced, the maximum world population might have reached not more than 20 million. From 5500 B.C. onward total world population might have increased slowly to approximately 30 million around 3500 B.C., with 20 million as the lower and 40 million as the upper limit. As a result of the improvement in agriculture and the more abundant food supply available during the subsequent 2,000 to 3,000 years, world population grew more rapidly. The 100 million mark was most likely reached during the period 1000–500 B.C., and the 200 million mark might have been passed during the early or middle Roman Empire with the most populous areas being in the Far East. During the first 1,000 years of the Christian Era, world population grew slowly and was somewhere around 275 million[4] by 1000 A.D. Recurrent famines, pestilences and wars occurred in the world during the next 600-700 years. In spite of all these setbacks world population increased slowly to around 500 million by 1650 A.D. Man probably has lived on this planet for over a million years. During most of the time of his existence, the average annual rate of population growth could not have been greater than 0.02 per cent. The average annual rates of growth have been estimated at 0.04 per cent, 0.06 per cent, and 0.07 per cent for the periods 5500–3000 B.C., 3000–850 B.C., and 850 B.C.–1650 A.D. respectively. Thus, even with the advent of agriculture, the growth rate of man had increased very slowly up to around 1650 A.D.

B. *The Growth of World Population by Regions, 1650–1957*

Population estimates covering the period 1650–1957, for the world and its continental divisions, are presented in Table I. (All tables in this volume are presented in a separate section, "Statistical Tables," pages 64-81). The estimates for the period 1650 to 1900 are based on the careful research of the noted demographer, Carr-Saunders; those for the period 1920–1957 were compiled by the United Nations Population Division. The estimates presented in Table I show that there were 545 million inhabitants on earth in 1650 and 1,608 million in 1900. But by 1957 the number of inhabitants surged up to 2,795 million. This suggests that the world in 1957 had five times as many inhabitants as the world in 1650, and represents an average annual rate of growth of about 0.53 per cent. Owing to the suspected wide margin of possible error in the estimates, especially for the earlier part of this period, the finding is undoubtedly subject to reservation. Nevertheless, the increase of population during the past three centuries has been impressive.

A breakdown of the annual rate of growth into several shorter periods would offer a completely different picture. As can be seen in Table II, the average annual rate of growth for the period 1650–1750 was only 0.29 per cent, but the rate increased steadily to 0.88 per cent for the period 1900–1950. If we have a further breakdown of the period 1900–1950, we can find that the average annual rate of growth increased from 0.59 per cent for the period 1900–1920 to 1.11 per cent for the period 1930–1940. Owing to the destructive effect of World War II the annual rate of growth dropped slightly during the period 1940–1950. However, the rate of growth increased sharply to a new high of 1.63 per cent for the period 1950–1957.

All these estimates of growth during the past show that the rate of growth has actually been accelerating. Even at the rate for 1950–1957, 1.63 per cent per annum, the world population would double itself in 43 years.

According to the data in Table I, between 1650 and 1900 the percentage distribution of world population in the six regions tended to fluctuate greatly and did not give a stable pattern of geographical distribution. Large scale migration during that period, no doubt, will account, to a great extent, for such fluctuation. Nevertheless, the great bulk of the world inhabitants lived mainly in Asia and Europe then. Although Europeans migrated in large numbers to the American continents during that period, Europe's percentage share of the world population still increased from 18.9 per cent in 1650 to 26.3 per cent in 1900 while that of Asia declined from 60.0 per cent in 1650 to 56.9 per cent in 1900. Africa is the only other continent whose percentage share of the world population declined steadily from 18.3 per cent in 1650 to 7.5 per cent in 1900. On the other hand, the percentage shares of the New World increased greatly with the influx of immigrants from Europe and Africa. The percentage share of Latin America increased from 2.2 per cent in 1650 to 3.9 per cent in 1900 while that of North America increased from 0.2 per cent to 5.0 per cent.

Thus the percentage distribution of world population in the six regions between 1650 and 1900 apparently was marked by the following characteristics: (1) a steady decline in the percentage of world population inhabiting Africa; (2) a declining cycle in the percentage distribution of population in all Asia outside of the U.S.S.R.; (3) an increasing cycle in the percentage distribution of population in the two Americas and Oceania; and (4) a continuing rise in the percentage distribution of population in Europe and the U.S.S.R., largely at the

expense of Africa and of the rest of Asia. Migrations from Europe and Africa to the Americas and from Europe to Australia occurred during this era and influenced the distribution of population in these areas. Obviously, the scale of immigration from Europe into Africa was too small to affect the long-term distribution in Africa relative to the distribution in other regions of the world.

During the period 1920–1957 a relatively stable pattern of geographical distribution of world population can be observed from data in Table I. Inhabitants of Africa comprised 7.7 per cent to 8.0 per cent of the world population while those of Northern America and Oceania comprised 6.5 per cent to 6.8 per cent and 0.5 per cent respectively. Thus the shares of these three areas can be considered as relatively stable. The percentage share of Asia increased slightly from 53.4 per cent in 1920 to 55.7 per cent in 1957 while that of Latin America increased from 5.0 per cent to 6.9 per cent. Europe, including U.S.S.R., was the only continent whose percentage share decreased during that period, from 26.9 per cent in 1920 to 22.1 per cent in 1957.

Thus in the twentieth century, the distribution of population between the regions had definitely entered into a new phase: (1) the percentage distribution in Africa seems to have touched bottom around the turn of the century and to have entered the increasing phase of a cycle that was on the decline three centuries earlier; (2) in Asia, outside the U.S.S.R., the percentage distribution also seems to have reached a floor in the early part of the century and thereafter to have begun a climb that has apparently levelled off in recent years at 55 per cent of the total world population; (3) while the percentage share in North America fluctuated between 6 and 7 per cent, the percentage distribution in Latin America continued to show an upward trend, and in 1957 was

slightly greater than the North America percentage; (4) the distribution in Oceania seems to have levelled off and become stabilized at one-half of one per cent of total world population; and (5) the percentage share in Europe and U.S.S.R. reached its peak in the early part of the century and has been declining since.

Based on the above analysis, it would seem correct to imply that the course of the relative distribution of world population in the different regions proceeds in a succession of cycles extending over long periods of time.

Since international migrations during 1920–1957 were not large relative to those of the period 1650–1900, the increasing share of Latin America as well as Asia and the decreasing share of Europe and U.S.S.R. can be explained largely by changes in the rate of natural increase, especially of the former two continents. Asia's share of world population has been above 50 per cent for several centuries. Her average annual rates of growth in the decades of 1920–1930, 1930–1940, 1940–1950 are respectively 1.61 per cent, 1.24 per cent, and 1.29 per cent, which are considerably above the corresponding world averages of 1.07 per cent, 1.11 per cent, and 1.06 per cent (see Table II). Before 1920 Latin America's share of the world's population was less than 5 per cent. For the three decades between 1920 and 1950 her average annual rates of growth were 1.8 per cent, 1.9 per cent, and 2.2 per cent respectively, which were 80-100 per cent greater than the corresponding world average rates. To a great extent, these very rapid rates of growth accounted for Latin America's increasing share of the world population during 1920–1950. The average annual rate of population growth in Europe declined from 0.89 per cent in 1920–1930 to 0.04 per cent in 1940–1950, the decade of World War II. These declining rates largely explain Europe and U.S.S.R.'s decreasing share of the world population during these

three decades. One significant fact is that in every region the average annual rate of growth during 1950–1957 was much higher than in the preceding three decades. Oceania and Latin America led the world in the annual rate of population increase, 2.2 per cent and 2.4 per cent respectively, during 1950–1957. Asia's annual rate of growth, 1.74 per cent, was close to that of the world average, 1.63 per cent, for the same period. Since more than half of the world inhabitants live in Asia, such a rate of growth, a rate which would double the population in about 40 years, does not offer much prospect of relief to the population pressure of that continent. Europe was the only continent whose annual rate of growth, 1.07 per cent, was below that of world average during the same period, although this rate was higher than those of the preceding two decades for that continent. The rates of growth during 1950–1957 for most of these continents can be considered fairly high. Nevertheless, at the 1950–1957 rates of growth, the number of years that it would take to double the population would be about 43 years for the world, 40 years for Africa, 41 years for Northern America, 65 years for Europe, including U.S.S.R., 31 years for Oceania, and 29 years for Latin America.

CHAPTER THREE

The Estimates of World Population Increase in the Future

A. *The Estimated Growth of Future World Population by Regions, 1975–2000*

The data of world population for 1975 and 2000 used in the following discussion are based on the published population estimates of the Population Branch of the United Nations. These estimates were calculated by the United Nations from theoretical population models adjusted to accord with observed facts. As is well known, future population growth is affected by many social and economic factors. It is, indeed, difficult to predict accurately what the world population will be 40 years or even 15 years hence. These estimates for future population growth, nevertheless, provide us valuable information on the trend of world population, provided neither a catastrophe nor a deterioration of medical progress of world proportions occurs during the remainder of the present century.

As has been mentioned previously the total world population was only 1,608 million in 1900, but reached 2,495 million fifty years later. By 1958 it increased further to 2,852 million. Many of us are already concerned with this rapid growth and the tremendous yet unfinished task of adequately feeding and clothing even the present size of world population. However, the medium estimates[5] of the United Nations indicate that the world population will

continue to grow rapidly during the remainder of our century and will reach probably 3,828 million by 1975 and 6,267 million by 2000 (see Table III). This implied that there will be an increase of 53.3 per cent in the world population between 1950 and 1975 and another increase of 63.7 per cent between 1975 and 2000. Thus the world population in 2000 will be 2.5 times as great as that in 1950. This is a result of the rapid rate of growth predicted for the next few decades. The average annual rate of growth is expected to be slightly less than 1.9 per cent between 1950 and 2000. However, a breakdown of this fifty-year period into two twenty-five-year periods shows that the average annual rate will be even higher in the last quarter of this century, about 1.7 per cent for 1950–1975 and 2.0 per cent for 1975–2000 (see Table IV). Thus a long view of the average annual rate of world population growth will show that the rate of increase is actually an accelerating one. The rate was 0.3 per cent for the period 1650–1750, 0.4 per cent for the period 1750–1800, 0.5 per cent for the period 1800–1850, 0.6 per cent for the period 1850–1900, 0.9 per cent for the period 1900–1950, 1.6 per cent for the period 1950–1957 and the projected rates for the periods 1950–1975 and 1975–2000 are, as stated previously, 1.7 per cent and 2.0 per cent respectively.

Among the seven regions in the world Latin America is predicted to have the greatest percentage increase in population during the period 1950–2000, an increase of 263.2 per cent (see Table IV). Asia is ranked second in the increase, 180.4 per cent, while Europe is expected to experience the smallest increase, 65.0 per cent. The population of Africa, Latin America and Asia (excluding U.S.S.R.) are expected to grow faster in the period 1975–2000 than in the period 1950–1975, while those of Northern America, Europe, U.S.S.R., and Oceania are expected to

grow slower in the fourth quarter than in the third quarter. Because of the difference in the percentage increase of population for these continents, Asia (excluding U.S.S.R.) and Latin America are expected to have a greater share of the world population by 1975 and 2000, while the share of the world population of Europe, U.S.S.R. and Northern America are expected to decline. Asia (excluding U.S.S.R.) whose share of world population was already 55.3 per cent in 1950 is expected to contain 57.7 per cent of the world population in 1975 and 61.8 per cent in 2000 (see Table III). Latin America's share will increase from 6.5 per cent in 1950 to 7.9 per cent in 1975 and 9.4 per cent in 2000. Europe, including U.S.S.R., is expected to reduce its share greatly in the future, a drop from 23.0 per cent in 1950 to 19.7 per cent in 1975 and a further drop to 15.1 per cent in 2000. But the share of Europe, excluding U.S.S.R., will drop from 15.7 per cent in 1950 to 12.4 per cent in 1975 and 9.1 per cent in 2000, while that of U.S.S.R. will reduce from 7.3 per cent in 1950 and 1975 to 6.0 per cent in 2000. Northern America will follow the same trend as that of Europe; its share will drop from 6.7 per cent in 1950 to 6.3 per cent in 1975 and 5.0 per cent in 2000. The two other regions, Africa and Oceania, are expected to hold their own throughout the next few decades. Their shares will remain at around 8.0 per cent and 0.5 per cent respectively for 1975 and 2000. An examination of the average annual rate of projected population growth in these seven regions in Table IV shows that Latin America will experience the rapid rate of 2.5 per cent for 1950–1975 and 2.7 per cent for 1975–2000, while Asia will also experience the rapid rate of 1.9 per cent during 1950–1975 and 2.3 per cent during 1975–2000. Europe, including U.S.S.R., is expected to have a rate of about 1.1. per cent for 1950–1975 and 0.9 per cent for 1975–2000. But the rate of Europe, excluding U.S.S.R.,

will be about 0.8 per cent and 0.7 per cent for the corresponding periods, while that of U.S.S.R. will be 1.6 per cent and 1.3 per cent. Northern America's rate will drop from 1.4 per cent to 1.1 per cent for the corresponding periods.

As one pauses for a moment to relate the trends of the past and future growth of world population described above, it seems fair to conclude that the twentieth century will not only be a unique phase in human history for progress in science, but also unique in its rapid increase in the numbers of the human species. No previous century has experienced an increase in the number of inhabitants as great and as rapid as will this century, nor can we yet conceive of the vast changes in human institutions which will be required to sustain this great number of the human species in the future. If one has not previously been concerned with this rapid growth of world population, one may begin to ponder the consequences of such unprecedented growth. If one has been concerned with such problems in the past, one is more apt to consider with intense anxiety the tremendous and yet unsolved problem of feeding and clothing adequately the present number of world inhabitants, let alone the additional new inhabitants who, with relative certainty, are expected to add billions to the population of this planet by the end of this century.

B. *Great Contrast Among Regions with Respect to the Rate of Population Growth and to Population Density*

In order to have a clear view of the changes in population in various parts of the world, it is necessary to break down the six continents into a larger number of world regions. Table V shows the projected percentage change of population in the nineteen world regions the delineation of which follows strictly the practice of the Population

Branch of the United Nations. For both the periods 1950–1975 and 1975–2000 the greatest percentage increases in population are expected in Central America, Tropical South America, Southwest Asia, Northern Africa and Southern Africa while the three regions of Europe, Northern America and Japan and the Ryukyu Islands are the five regions that are expected to have the smallest percentage increase. It is interesting to note that countries in the five regions with the greatest percentage increase are, generally speaking, technologically underdeveloped. On the other hand, countries in the five regions with the smallest percentage increase are, in general, developed technologically.

Not only does the rate of population growth vary greatly among the nineteen world regions but also the population density. As can be seen in Table VI, the population density in 1950 was 18.5 persons per square kilometer for the world while it ranged from 1.3 persons for Australia and New Zealand to 224.7 persons for Japan and the Ryukyu Islands. In view of these contrasts in population density it would be desirable to sort these nineteen regions into four larger groups: (1) high population density with expected fast rate of growth, (2) low population density with expected fast rate of growth, (3) high population density with expected slow rate of growth, and (4) low population density with expected slow rate of growth. The criterion for judging the high or low population density is the population density of the world total in 1950 while that for judging fast or slow rate of growth is the percentage increase of world population for the period 1950–2000.[6] The criteria used here are obviously arbitrary in nature; nevertheless, they serve to point out the great contrast existing among the four groups.

On the basis of these criteria, the four groups of regions[7] are sorted out from the data presented in Tables V and VI.

A summary of the information for these four groups is shown in Table VII. Group I, regions of high population density with fast rate of growth, occupies 15.8 per cent of the land area of the world and is expected to increase its share of world population from 50.0 per cent in 1950 to 56.7 per cent in 2000. It is anticipated to account for 61.2 per cent of the total increase of world population for the period 1950–2000. Nations included in this group are generally less developed economically and are also low in per capita income. Group II, regions of low population density with fast rate of growth, contained only 9.7 per cent of the world population in 1950, but is expected to contain 14.3 per cent of the world population in 2000. About 17.4 per cent of the total increase in world population between 1950 and 2000 will be accounted for by this group. Group II occupies 22.9 per cent of the land area of the world and includes nations which are generally less developed economically and are also relatively low in per capita income. By contrast, Group III, regions of high population density with slow rate of growth, is expected to decrease its share of the world population from 19.1 per cent in 1950 to only 11.6 per cent in 2000. This group is anticipated to account for 6.5 per cent of the total increase in world population between 1950 and 2000. It occupies only 3.9 per cent of the land area of the world and had the highest population density in 1950. However, its population density is likely to be surpassed by Group I in 2000. Nations included in Group III are, as a whole, highly developed economically and have a relatively high per capita income. Similarly, Group IV, regions of low population density with slow rate of growth, is also expected to reduce its share of world population between 1950 and 2000, from 21.2 per cent to 17.4 per cent respectively. About 14.9 per cent of the total increase of world population between 1950 and 2000 will be ac-

counted for by this group. The group occupies 57.4 per cent of the land area of the world, and most of its member nations, except those in Middle Africa and Temperate South America, are highly developed economically with per capita income level among the highest in the world.

By combining Group I and Group II we find that these two groups, occupying 38.7 per cent of the land area in the world, will account for 78.6 per cent of the increase of world population between 1950 and 2000, and will contain 71.0 per cent of the world population in 2000 as compared with the 59.7 per cent in 1950. Nations in these groups form the bulk of the economically less developed nations in the world and, in general, have relatively low per capita income. By contrast, Group III and Group IV together occupy 61.3 per cent of the world land area, but are expected to contain only 29.0 per cent of the world population in 2000 as compared with 40.3 per cent in 1950. Together, these two groups will account for 21.4 per cent of the increase of world population between 1950 and 2000. Nations in these two groups include nearly all the economically highly developed nations in the world and, in general, enjoy high per capita income. Since nations in Groups I and II, as a whole, are less developed economically than those in Groups III and IV, the population pressure is expected to be felt even more keenly by nations in the former two groups than in the latter groups. It seems that the problem of population pressure will be of the first magnitude for nations in Group I since these nations are already densely populated as well as less developed economically. Comparatively speaking, the problem of population pressure, if any, will be the least serious for nations in Group IV since these nations are thinly populated and economically already well developed.[8] It is highly probable that some nations in Groups I and II may experience rapid economic development

within the next few decades. However, this does not imply that population pressure can thus be relieved significantly in these two groups, especially Group I. Short of a combination of unprecedented speed of economic development and unprecedented speed in the reduction of the rate of population increase, the problem of growing population pressure for these two groups should be expected as a matter of certainty. In short, the problem of population pressure in Groups I and II, especially for the former, can be viewed with fairness as the thorn of the world problem in the foreseeable future. The future well-being, peace, and security of people in these two groups, especially Group I, will no doubt be greatly affected by the rapid population growth there. Since about 71 per cent of the world population in 2000 will be accounted for by these groups, the future well-being, peace, and security of the world will also be affected by the population problem there. Thus the population problem of these groups should be viewed as the population problem of the world.

CHAPTER FOUR

The Estimates of the Vital Statistics of the World by Regions

A. *Causes of the Rapid Growth of World Population in Recent Years*

Why did the world population increase so rapidly during the recent past? A simplified answer is that the increasing rate of extension to Asia, Latin America, and Africa of the modern methods of controlling communicable diseases, including health services to help reduce infant deaths, greatly reduce the death rate in these areas. However, in these areas the decline in death rate has not been accompanied by a drop in birth rate, i.e., the "demographic gap"[9] has been widened, and so population has increased sharply. For instance, between 1950 and 1957 the world population increased by 300 million of which 233 million live in these areas. In other words, about 78 per cent of the total increase in world population during 1950–1957 was accounted for by these areas.

Modern medicine can help reduce very sharply the death rate of a nation characterized by a high death rate within a matter of one to two decades. For example, the death rate for Ceylon, which averaged about 21.4 per thousand[10] for the period 1935–1940, dropped steadily to 11.2 per thousand for the period 1951–1955. However, the death rate for England and Wales for the period as late as 1868–1872 was 22.2 per thousand,[11] but the rate

did not drop as low as about 12 per thousand until the period 1928–1932. In other words, so far as reducing the death rate is concerned, Ceylon, in modern times, accomplished in about 15 years what it took England and Wales 60 years to accomplish.

An examination of the changes in the vital statistics of the world regions may offer us a clearer view of the changes in rates of growth in these regions. Tables VIII and IX present the estimated vital statistics for regions of the world during the past three decades. Data in these two tables are not strictly comparable since they are the results of two studies in which different delineations of world regions were used, nevertheless, they serve to reflect the approximate trend of natural increase. The rates in Table VIII suggest that the world population increased slightly faster in the late 1940's than in the late 1930's. The increase in the rate of growth is explained partly by the increase in birth rate in the later period in Northern America, Japan, North-West-Central Europe and Oceania, and to a great extent by the decrease in death rate, especially in areas such as Africa, Latin America, South-Central Asia and Southern Europe. By comparing the rates for the later period in Table VIII with those in Table IX, one gains the impression that the rate of growth in world population continued to increase between the late 1940's and early 1950's. The acceleration of growth is mainly explained by the considerable decline in death rate notably in Asia, Europe, and Oceania in the early 1950's. Although the birth rate also declined slightly in some regions in the early 1950's, these declines were apparently more than offset by the greater decline in the death rates.

B. *Reasons for the Expectation of Rapid Growth of World Population in the Near Future*

Why is world population expected to increase with greater speed during the next few decades? A short answer to this question is that the continuation of the appreciable drop in death rate, such as has happened in the recent past, is expected to prevail in Asia, Latin America and Africa in the next few decades, i.e., the "demographic gap"[12] is expected to grow continuously during the next few decades. Data in Table X show the anticipated changes in vital rates in different regions between 1950 and 1975. These data reveal that the birth rate in most regions may decline slightly between 1950 and 1975. However, these declines are more than offset by the appreciable drop in death rate, notably, in Asia, Latin America, and Africa. As a result, the great increase of population in these areas is expected to account for 81 per cent of the anticipated increase of world population of 1,331 million between 1950 and 1975 and 86 per cent of the increase of 3,770 million between 1950 and 2000. In short, the widening "demographic gap" of the world is solely the result of an ever widening "demographic gap" which has occurred in Asia, Africa, and Latin America.

From the same table above one can also find that the technologically more developed areas such as Northern America, Europe, U.S.S.R., and Oceania have a fairly low birth rate and death rate and are expected to remain in that state in the future. By contrast, the technologically less developed areas such as Asia (excluding Japan), Latin America and Africa have a very high birth rate as well as death rate, but the birth rate is expected to remain high while the death rate will probably drop appreciably. The factors making for lowered birth rate and death rate

in Northern America, Europe, U.S.S.R. and Oceania are urbanization and modern medical technology, the products of industrialization. Industrialization and urbanization have not yet penetrated deeply into Asia (excluding Japan), Latin America and Africa, whereas modern health services, which normally lower death rate, have. Since any rapid large-scale industrialization in these three areas, with the possible exception of a few nations, probably could not be realized in less than thirty to forty years, it is not at all unrealistic to assume an unprecedented increase in population in these areas within the next few decades. The only other possible means of retarding such great surge of population in these areas would be the consistent practice of birth control by the people, through the help and guidance of their governments.

CHAPTER FIVE

Why Should We Be Concerned with the Rapid Growth of World Population

When we refer to the rapid, present and imminent, growth of world population as one of the most serious problems that the human species has yet to face, we should not expect to have a unanimous agreement on this point. Whether or not the rapid growth of world population is a serious problem depends upon the evaluation of the maximum carrying capacity of the earth, i.e., the maximum number of human beings that can be supported by the earth's resources. There is, however, no general agreement about such maximum carrying capacity. Estimates of the maximum carrying capacity vary with the standard of living to be supported, the level of technology which determines the potential resources, and the organization of social institutions that may either impede or facilitate the extension and application of technology. For instance, so far as foods are concerned, the estimates by various experts of the earth's maximum carrying capacity ranged from not much over 2,800 million people to 16,000 million people.[13] When not just food but all potential natural resources are taken into consideration, the judgments on the degree of seriousness of the problem of population pressure also vary greatly. On the one extreme there are those who perceive the destruction of mankind in the foreseeable future unless the birth rate is drastically reduced within the immediate future. On the other extreme are those who forecast a

world of abundance looming for mankind in the future. With the mushrooming progress of science and technology they feel that man will have an inexhaustible supply of fuel from the sun, the air (hydrogen), uranium, etc., an unlimited supply of minerals from the sea and from ordinary rocks, etc., an abundance of food supply from improved farming methods, the wide variety of sea foods by "industrial farming," algae culture, hydroponic tank farming, factories using photosynthesis, etc. This volume does not attempt to survey or evaluate the various opinions regarding the potential carrying capacity of the earth. In addition, it is irrelevant to analyze the population pressure from the viewpoint of how many more mouths the earth's potential resources could feed, with qualifications by many "ifs," in the future. The problem of population pressure should be viewed from the more relevant standpoint of how would the regional and world population pressure affect the problem of achieving a higher living standard. An examination of the existing disparity in consumption levels among people in different parts of the world helps us realize the tremendous, yet unfinished task of adequately feeding and clothing the present size of world population and, therefore, in evaluating the adverse effect of further population growth on the problem of attaining a higher living standard.

Let us peer into some of the crucial situations existing in the world of today, a world divided by want and plenty.

A. *The Yearnings of People in the Poorer or Less Developed Lands, Who Make Up About Two-thirds of the Human Race*

As mentioned previously, the world of the 1960's is a smaller, more interdependent and interrelated world.

More than that, it is also a world in ferment. The two-thirds of mankind who inhabit mainly Asia, Africa, and Latin America, where the rate of population increase has been very rapid, possess generally less wealth and power than those who mainly inhabit North America and Europe. They are waking up quickly and are increasingly conscious of their poverty, serious malnutrition problems, poor health and sanitation conditions, high rate of illiteracy, etc. Many of them are yearning for a better material life and the attainment of human dignity. They are eager to earn a respectable place for themselves among the nations of the world but they want to develop their economy in their own way without interference or dominance from the technologically developed nations. We need only to mention a few examples of these nations which are awakening and yearning for a better material life. Many nations in these three continents have their own plans of economic development. The ambition and longing of the Egyptian government for building the Aswan Dam is one noted example of such aspirations. The five-year plans of India are another example of the genuine desire to uplift the material well-being and reduce the high rate of illiteracy of the inhabitants. The ambitious five-year plans of Communist China represent the extreme case. It desires to attain within a short period of fifteen years the level of industrial achievement achieved by the technologically advanced nations during the past 100-150 years. They probably are more of "a people in a hurry" than inhabitants of other less developed areas. In short, people in these less developed lands increasingly desire to reduce the existing gap of material well-being between them and the more highly industrialized nations. However, the deep awareness of their poverty is not accompanied by the equivalent awareness of the fact that their goal and effort

for economic development as well as higher standards of living will be either handicapped or overburdened by the unprecedented increase of their population.

B. *How Great Are the Existing Disparities in Material Well-being Between the Highly Developed Nations and the Less Developed Nations?*

It has been indicated that nations with the most serious problem of rapid population growth are, in general, economically less developed and mainly located in Asia, Africa, and Latin America. Since many nations in these three continents desire to reduce the gap of material well-being between their own and the more developed nations, a brief survey of the magnitude of this gap will serve to point out the mammoth task to be accomplished in the future to close it.

1. *Contrasting levels of education.* Let us first examine the contrasting levels of education in different parts of the world. Data in Table XI show that for the period 1949–1955, nations with a literacy rate of 50-80 per cent and over 80 per cent are mainly in North America, Europe, Oceania, and U.S.S.R. where economic development already is at an advanced stage. On the other hand, nations with a literacy rate of 20-50 per cent, or under 20 per cent are found mainly in Africa, South America, and Asia (excluding Japan and Israel). As is generally known, progress in economic development of any nation is, in a general way, closely associated with the level of education it attains. The task of raising the literacy level for the present size of population in these nations would, indeed, require a very great effort on their part. The task would

be made more difficult if those nations continue to experience a rapid growth of population in the future.

2. *Great disparities in per capita national income and national product.* Let us next turn to the disparity in national income and per capita national product among different regions of the world. Data in Table XII show that in 1949 Africa, Asia, and South America together contained 65.8 per cent of the world population, but shared only 16.6 per cent of the world national income. North America, Europe, Oceania, and U.S.S.R. represented 34.2 per cent of the world population, but their share of the world national income was 83.4 per cent. As a result the per capita national income[14] was extremely low in the former three regions, especially Asia. If the per capita income of Europe in 1949, $380, were established as the goal for nations in the first three regions, then these nations would have to increase their national income by about four times in Africa, about 6.6 times in Asia, and 1.2 times in South America. If nations in these three regions set the per capita income of North America in 1949, $1,100, as their goal, nations in Africa as a group would have to increase their national income by 13.6 times, nations in Asia by 21 times, and nations in South America by about 5.5 times.

Data in Table XIII show the per capita net national products of fifty-two nations in five continents in more recent years. Though the absolute differences in per capita net national product among nations should not be considered as a satisfactory yardstick for measuring their level of welfare and condition of living, nevertheless, it reflects the crude order of magnitude of their per capita product of goods and services. At least, great disparities in the per capita production of goods and services between less developed nations and industrialized nations (or be-

tween nations in regions with a rapid rate of population growth and nations in regions with a slow rate of population growth) in more recent years can be noticed from these data.

3. *The impeding effect of rapid population growth on raising the living standards.* At a constant growth rate of 5 per cent per year, the national income of a nation would double in about fourteen years, while at a growth rate of 10 per cent per year the national income of a nation would double in about seven years. Judging from the growth rate experienced by the industrialized nations in the past (not including centrally planned economies), an average growth rate of 10 per cent per year would most likely not be attained by most of the nations in these areas in the foreseeable future. However, the growth rate of about 5 per cent per year would probably be within the reach of most of these nations provided they embark seriously on a constructive and effective development program. Let us take Asia as an example, and assume that the Asian nations as a group will have a growth rate in national income of 5 per cent per year and take the per capita income of Europe in 1949, $380, as their goal. These nations as a group, with the per capita income of $50 in 1949, would require about forty-two years of constructive and hard work on their economic development program before the per capita income of Asia could reach the level attained by Europe in 1949—provided their population remained constant during the forty-two years following 1949. Since population in Asia will continue to grow rapidly, it would take many more years for Asian nations to reach that same goal. For simplicity, the great variations in available resources, level of technology, existing population pressure, political stability, administrative efficiency, etc., among the Asian nations were not taken into consideration in the

above example. This example, though admittedly oversimplified, serves to point out the overwhelming task these nations would face in order to close the gap of material well-being between their present level and the European level of 1949 in general. If the population growth in Africa, South America, and Asia, especially the last, continues to lead, as anticipated, the other three regions in the future, the gain in their economic development effort would, no doubt, be greatly set back or partially nullified.

In his paper delivered at the World Population Conference, 1954, Mr. Samuel W. Anderson[15] stated that on the basis of a population increase of approximately 4.5 million in 1950, India would have to generate a net capital formation of approximately $1.2 billion in that year just to keep the per capita income constant. It was estimated that the capital formation in that year was probably below the level of $1.2 billion. Thus the fruit of economic development in 1950 was completely consumed by the increased population and no net improvement of per capita income was realized. Since available capital for development was usually scarce in nations with less developed economy, rapid population growth would, without any doubt, greatly hamper the effort of less developed nations to close the gap.

4. *Contrasting levels of food consumption.* Let us next examine the existing disparities in the level of food consumption among nations in different regions of the world. Data in Table XIV show the available calories as against the daily per capita requirement for selected nations in different regions. Nations with food supplies below the requirement are found mainly in Asia, Africa, and Latin America while nations in excess of the requirement are mainly found in Europe, North America, and Oceania. It is, however, encouraging to find that nations with a deficit

in intake of calories in the early postwar years have reduced their deficit somewhat in recent years (see Table XIV). But it should be noted that caloric intake reflects only the amount of food consumed, not the quality of diet. Table XV shows the proportion of total caloric intake per capita supplied by carbohydrate-rich foods for selected nations in recent years. If the proportion of total caloric intake from starchy foods is high, it indicates that the proportion from protective foods such as milk, meat, eggs, fishes, fruits, vegetables, etc., must be low. During the period 1953–1954 to 1954–1955 nations with over 50 per cent of their caloric intake from carbohydrate-rich food were found mainly in Asia, Africa, and parts of Latin America. Judging from the data in Tables XIV and XV it seems that nations in Latin America, Africa, and Asia, especially the two latter regions, do not have adequate per capita food consumption either in quality or in quantity. More refined estimates of food consumption in different world regions were made by Political and Economic Planning of London. According to its report[16] of 1955, 73 per cent of the world population in 1950 were underfed, of whom 7 per cent were in Europe (largely in Eastern and Southern Europe), 6 per cent in Latin America, 53 per cent in Asia and 7 per cent in Africa. But the distribution of world population in 1950 in these regions was 23 per cent in Europe, including U.S.S.R., 6.5 per cent in Latin America, 55.3 per cent in Asia, and 8.0 per cent in Africa.

C. *The Race Between Food Production and Population in Recent Years*

Data in Table XVI show food production, total and per capita, in specified regions of the world for the prewar and postwar periods relative to the Second World War.

At first glance the food production for all regions in the world showed a great increase between the prewar period and 1957–1958 and thus gives us a sign of relief. However, an examination of the per capita food production in different regions gives us a somewhat different impression. The per capita food production in the Far East, Latin America, and Oceania in 1957–1958 was below the prewar average. Since Oceania is still a region with adequate per capita food consumption and surplus food for export, its decline in per capita production in recent years does not deserve much alarm. However, the situation in the Far East and Latin Ameirca should deserve much anxiety since the per capita food consumption has been inadequate in these regions. By contrast, the per capita food production in North America greatly increased during the postwar years. For the world as a whole, the increase in total food production was 2.0 per cent per annum from 1953–1954 to 1957–1958, as compared with an annual rate of population growth of 1.6 per cent for 1953–1957.[17] Thus during the past few years there has been a very uncomfortable race between food production and population increase in the world. But the results of the race were uneven in various regions. Nations in North America, such as the U.S.A., have accumulated more and more surplus foods while poor nations in the Far East and Latin America still have not attained the prewar level of per capita production and are still confronted with the problem of underconsumption and underproduction.

In short, for the past few years, 1953–1954 to 1957–1958, the world food production has left a scanty margin of 0.5 per cent extra annually to improve the diet of millions of people. Even this 0.5 per cent of extra food production is not available automatically to the millions of underfed people. For instance, the stock of surplus agricultural products (food and nonfood) owned by the U.S. Commodity

Credit Corporation, remained at the value of 7-8 billion dollars since 1955. Since the surplus products have remained at that high level for the past few years, it is an indication that the surplus accumulated by nations with overproduction problems would not all be available automatically to nations with underconsumption and underproduction problems.

Success in closing the gap between per capita food requirement and supplies by nations in Asia, Africa, and Latin America in the future depends, to a great extent, upon the future rate of population growth in these regions. The experience since World War II, of course, does not suggest that food production has comfortably outstripped the population growth in these regions. Since world population is anticipated to grow rapidly in the next few decades, a dramatic increase in food production is urgently needed just to keep the world population at the current level of consumption, a level at which about 70 per cent of the people are grossly underfed. Moreover, Asia, Africa, and Latin America, where the rate of population growth is anticipated to increase faster than that of the other regions in the world, would have to accelerate their food production even more drastically. If allowance is made for some improvement in food consumption in these three regions, the acceleration of food production will have to be even greater. The task ahead for most of these nations is, indeed, alarmingly great and difficult. Apparently, even a rapid reduction of the rate of population growth in the near future will offer only slight relief to the difficult problem lying ahead of most of these nations.

D. *Facing the Problem of Future Overpopulation*

Judging from the present as well as the projected future sizes of world population, probably no responsible person

will insist that the world as a whole can still be considered as underpopulated now and in the near future. On the other hand, the question of serious overpopulation could not be answered in a very clearcut manner. No one will deny the possibility that the progress of science and technology in the distant future could bring abundance to all mankind. However, the population problem has to be viewed not only from the standpoint of future progress in science and technology but also from the standpoint of institutional and political conditions. Even at the present level of technology, if all the most advanced methods could be effectively applied to the production of food and industrial products, the present level of world production could probably be increased by many times. Unfortunately, the weakness of human nature and the inflexibility of social and political institutions in general often set limits on the use of the best methods in the most effective manner. As a result, practical accomplishments always lag behind what would be considered technically feasible. This probably will hold true in the future. Because of the rigidity of social and political structures, many nations have not yet developed the economic institutions which will consciously and effectively utilize known methods to develop their economies. Consequently, these nations are beset by the problem of underproduction and underconsumption. Even the technologically and economically most advanced nations are not completely immune from such rigidity and hindrances. At best we can say that the degree of rigidity and hindrances is much less serious in the highly developed nations than in the less developed nations.

Considering the inflexibility of social and political setups, the no cure-all solution of science at the present and in the foreseeable future, the existing disparity in production and consumption levels among nations, current

population density, current and anticipated future rates of population growth, and the burdens of rapid population growth on present and future economic development, it is fair to conclude that the world is already overpopulated, especially in Asia, Europe, and parts of Africa and Latin America. Among all the continents, Asia,[18] without any doubt, is faced with a widening "demographic gap" of the first magnitude because Asia already is densely populated and seriously burdened by the problem of underconsumption and underproduction. Both Africa and Latin America are, of course, far from the densely populated situation of Asia, but, nevertheless, they are faced with the problem of producing too little and hence not having enough to consume. The anticipated rapid growth of population in these two regions will greatly impede, if not nullify, their effort to raise the living standard through economic development programs. In 1950 the population density of Europe (excluding U.S.S.R.) was 80 persons per square kilometer as compared with 51 persons per square kilometer for Asia (excluding U.S.S.R.). However, Europe's overpopulation problem is quite different from either that of Asia or that of Africa and Latin America. The current birth rate in Europe is, in general, the lowest in the world and even the future rate of growth is anticipated to be the slowest. Sooner or later Europe may no longer be threatened by the sharp imbalance originating from demographic trends. In addition, Europe has the advantage of having a highly developed technology and effective economic organization. Since the rapid growth of population in the crucial areas—Africa, Latin America, and Asia especially—will inevitably become the serious population problem of the rest of the shrinking, interrelated and interdependent world, the need of reduction of the birth rate in these crucial regions should, therefore, be viewed as an urgent world problem.

No matter how promising science and technology may be in bringing abundance to mankind in the distant future, this does not alter the fact that the practical economic accomplishments would ever lag behind what could be considered technically feasible, and the current race between food and population in many parts of the world will probably continue to be a highly uncomfortable one. Nor does it alter the fact that the task of adequately feeding and clothing the present size of the world population is tremendous, pressing and yet unsolved; or that scores of millions of new inhabitants are being added to the population of this planet every year, which makes the unsolved task even more embarrassingly difficult. Thus the most realistic and farsighted approach to this problem is still the rapid reduction in birth rate, as soon as possible, in the crucial world regions. It seems that for a long time insufficient world-wide attention has been devoted to this problem. There is probably no field in which scientific research and public awareness are more urgently needed than in the field of population growth, and none in which with timely action greater rewards in human welfare can be realized in the future.

CHAPTER SIX

Summary and Conclusion

In order to summarize and conclude the main points of this volume, this section is presented in the form of questions and answers. For explanations and details the readers are referred to the main body of this volume.

(1) *Why is it necessary to study and understand the population problem in the world of the 1960's?*

First, population is intimately involved with sociological, economic, political, and cultural developments which determine the well-being, peace, and security of the peoples of the world. The future world events will be affected greatly by the present rapid growth of world population.

Second, modern transportation and communication facilities have reduced the world of the 1960's to a much smaller size than before. The world of the 1960's is also more interdependent and interrelated than before. Any significant social and technological revolution or turmoil in one area has its inevitable impact and repercussion elsewhere. Without exception, the consequences of rapid population growth in some crucial areas of the world today tend to extend eventually to the rest of this shrinking, closely related world.

Lastly, the world of the 1960's is also a world in ferment. The two-thirds of the human species who inhabit mainly Asia, Africa, and Latin America are increasingly conscious

of their contrasting poverty as well as economic backwardness and desire to reduce the existing gap of material well-being between them and the more highly developed nations. But they are not keenly aware of the fact that their effort for economic development, as well as a higher standard of living, will be impeded greatly by their population problem—the alarmingly high rate of population increase. A study of the growth of population in various regions, especially the crucial regions, during the 1950's will provide us with a useful background to the understanding of this world problem and its solution.

(2) *What was the trend of population growth before 1650?*

During the early stage of mere food gathering, much earlier than 5500 B.C., the world population was probably about five million; the lower limit was set at two million and the upper limit at ten million. Through the advent of agriculture the world population increased slowly to around 545 million by 1650 A.D. The average annual rate of growth also increased very slowly from 0.02 per cent in a much earlier period to less than 0.1 per cent for the period 850 B.C. to 1650 A.D.

(3) *What are the trends of population growth in the world regions between 1650 and 1957?*

The world population grew rapidly during the 307 years following 1650 A.D. By 1957 the number of world inhabitants reached 2,795 million (see Table I). This shows that the world in 1957 had five times as many inhabitants as the world in 1650, and this increase reflects an average annual rate of growth of about 0.53 per cent for the period. A breakdown of the annual rate of growth into several

shorter periods reveals that the rate of growth has actually been accelerating. The rate increased steadily from 0.29 per cent for 1650–1750 to 0.88 per cent for 1900–1950. Within the period 1900–1950, the rate increased from 0.59 per cent for 1900–1920 to 1.11 per cent for 1930–1940 and dropped slightly to 1.06 per cent for 1940–1950. But it increased sharply to a new high of 1.63 per cent for 1950–1957 (see Table II).

The percentage distribution of world population in the six regions between 1650 and 1900 was marked by the following characteristics: (1) a steady decline in the percentage of world population inhabiting Africa; (2) a declining cycle in the percentage distribution of population in all Asia outside of the U.S.S.R.; (3) an increasing cycle in the percentage distribution of population in the two Americas and Oceania; (4) a continuing rise in the percentage distribution of population in Europe and the U.S.S.R., largely at the expense of Africa and of the rest of Asia. The bulk of the world's population then, as now, lived in Eurasia. Migrations from Europe and Africa to the Americas and from Europe to Australia occurred during this era and influencing the distribution population in these areas. Obviously, the scale of immigration from Europe into Africa was too small to affect the long-period distribution of population in Africa relative to the distribution in other regions of the world (see Table I).

In the twentieth century, the distribution of population between the regions had definitely entered into a new phase: (1) the percentage distribution in Africa seems to have touched bottom around the turn of the century and to have entered the increasing phase of a cycle that was on the decline three centuries earlier; (2) in Asia, outside the U.S.S.R., the percentage distribution also seems to have reached a floor in the early part of the century and, therefore, to have begun a climb that has apparently

levelled off in recent years at 55 per cent of the total world population; (3) while the percentage share in North America fluctuated between 6 and 7 per cent, the percentage distribution in Latin America continued to show an upward trend, and in 1957 was slightly greater than the North American percentage; (4) the distribution in Oceania seems to have levelled off and become stabilized at one-half of one per cent of the total world population; and (5) the percentage share in Europe and U.S.S.R. reached its peak in the early part of the century and has been declining since (see Table I).

Based on the above analysis, it would seem correct to imply that the course of the relative distribution of world population in the different regions proceeds in a succession of cycles extending over long periods of time.

For the three decades between 1920 and 1950 the average annual rate of population growth showed, in general, an upward trend for Africa, Latin America, and Oceania and a downward trend for Europe, including U.S.S.R., and Asia. In Northern America the rate declined greatly in the period 1930–1940, but in the period 1940–1950 it returned to the rate attained in 1920–1930. One significant fact is that in every region the rate during 1950–1957 was much higher than in the preceding three decades (see Table II). Oceania and Latin America led the world in the annual rate of population increase, 2.2 per cent and 2.4 per cent respectively, during 1950–1957. Asia's rate was 1.74 per cent which was close to the world average, 1.63 per cent, for the same period. Europe, including U.S.S.R., was the only continent whose rate of growth, 1.1 per cent, was below that of world average. At the 1950–1957 rate of growth, the number of years that it would take to double the population would be about 43 years for the world, 29 years for Latin America, 31 years for Oceania, 41 years for Northern America, 40 years for

Africa, 40 years for Asia, and 65 years for Europe, including U.S.S.R.

(4) *What are the future trends of population growth in the world regions?*

The world population will continue to grow rapidly during the remainder of this century and will reach, on medium assumption, 3,828 million by 1975 and 6,267 million by 2000 (see Table III). This implies that the world population in 2000 will be about 2.5 times as great as that in 1950. The projected average annual rate of increase was 1.7 per cent for 1950–1975 and 2.0 per cent for 1975–2000, or 1.9 per cent for 1950–2000. Thus a long view of the annual rate of world population growth shows that the rate has been and will be accelerating.

Latin America is expected to have a population increase of 263 per cent for the period 1950–2000, while Asia and Africa are estimated to show an increase of 180 per cent and 160 per cent respectively. The percentage increase for Oceania and Northern America will be 123 per cent and 86 per cent respectively for the same period, while U.S.S.R. is expected to show an increase of 109 per cent. Europe, excluding U.S.S.R., is expected to have the slightest increase, 45 per cent (see Table IV).

Because of the unusual rate of growth anticipated for Latin America and Asia from 1950 to 2000, the former's share of the world population is expected to increase from 6.5 per cent in 1950 to 9.4 per cent in 2000, and the latter's share will increase from 55 per cent in 1950 to 62 per cent in 2000. Africa's share will remain around 8.0 per cent. On the other hand, Europe's (excluding U.S.S.R.) percentage share of world population will decrease from about 16 per cent in 1950 to 9 per cent in 2000 and Northern America from 6.7 per cent in 1950 to 5.0 per cent

in 2000. The percentage share of world population by U.S.S.R. also will fall from 7.3 per cent in 1950 to 6.0 per cent in 2000, while the share by Oceania is expected to remain around 0.5 per cent for the period (see Table III).

Latin America is expected to experience the rapid annual rate of population growth of 2.5 per cent for 1950–1975 and 2.7 per cent for 1975–2000, while Asia will realize 1.9 per cent during 1950–1975 and accelerate to 2.3 per cent during 1975–2000. The rate for Africa will also increase from 1.7 per cent for 1950–1975 to 2.2 per cent for 1975–2000. Europe's (excluding U.S.S.R.) annual rate of growth is expected to fall from 0.8 per cent for 1950–1975 to 0.7 per cent for 1975–2000, while that of Northern America will drop from 1.4 per cent to 1.1 per cent for the corresponding periods. The rate for U.S.S.R. will fall from 1.6 per cent in 1950–1975 to 1.3 per cent for 1975–2000 (see Table IV).

(5) *Are there any great contrasts with respect to the rate of population growth and to population density among the 19 world regions?*

Great contrasts with respect to the rate of population growth and to population density exist among the 19 world regions. (For details see Tables V and VI.) In view of these contrasts the 19 regions can be sorted into four groups: I, high population density with expected fast rate of growth; II, low population density with expected fast rate of growth; III, high population density with expected slow rate of growth; and IV, low population density with expected slow rate of growth between 1950 and 2000. (For details see Table VII.) Groups I and II together will contain 71.0 per cent of the world population in 2000 as compared with 59.7 per cent in 1950 and will

account for 78.6 per cent of the increase of world population between 1950 and 2000. By contrast, groups III and IV are expected to contain only 29.0 per cent of the world population in 2000 as compared with 40.3 per cent in 1950 and will comprise 21.4 per cent of the increase of world population between 1950 and 2000.

(6) *What conclusion can be deduced from those facts revealed in (5)?*

Nations in groups III and IV include nearly all the economically highly developed nations in the world and, in general, enjoy high per capita income. Nations in groups I and II, as a whole, are less developed economically than those in groups III and IV; the population pressure is expected to be felt even more keenly by nations in the former two groups than in the latter groups. The problems of population pressure will be of the first magnitude for group I since these nations are already densely populated as well as less developed economically. Nations in group IV are thinly populated and economically already well developed and the population pressure, if any there, will be the least serious. Since 71 per cent of the world population in 2000 will be represented by groups I and II, the future well-being, peace, security of the world will also be affected by the population problem there. Thus, the population problem of these two groups, especially group I, should be viewed as the thorn of the world problem in the foreseeable future.

(7) *Why did the world population increase so rapidly during the recent past and why is it expected to increase with greater speed during the next few decades?*

Lowering the birth rate and death rate in Northern America, Europe, U.S.S.R., and Oceania are urbanization and modern medical technology—the products of industrialization. Industrialization and urbanization have not yet extended in any substantial degree to Asia (excluding Japan), Latin America and Africa. Modern health services which normally lower the death rate have deeply penetrated into these areas (see Tables VIII and IX). Thus the reduction in the death rate has been world-wide in scope while the same phenomenon did not occur in the case of birth rate, i.e., the "demographic gap" has been widened. (For explanation of "demographic gap" see footnote 9.) As a result, the world population has experienced an unprecedented growth in absolute number and in the rate of increase. The phenomenon of a widening "demographic gap" also is expected to prevail within the next few decades (see Table X).

(8) *What are those crucial areas with problems of widening "demographic gap" and what are the roles played by those crucial areas in accelerating world population growth in the recent past and in the foreseeable future?*

Among the seven world regions, Asia is facing a widening "demographic gap" of the first magnitude: Asia already is densely populated and seriously beset by the ever present problem of underconsumption and underproduction. Africa and Latin America are far from the densely populated situation of Asia but they are producing too little and hence not having enough to consume.

Between 1950 and 1957 world population increased by 300 million of which 233 million, or 78 per cent, was accounted for by these three crucial areas. Likewise, the anticipated great increase of population in these three

areas is also expected to account for 81 per cent of the anticipated gain of world population of 1,331 million between 1950 and 1975 and 86 per cent of the gain of 3,770 million between 1950 and 2000. Asia alone will comprise 67 per cent of the gain of 3,770 million while Latin America and Africa will make up 11 per cent and 8 per cent respectively. In short, the widening "demographic gap" of the world is solely the result of an ever widening "demographic gap" which has occurred in Asia, Africa, and Latin America. (For details see Tables IX and X.)

The overpopulation problem of Europe, excluding U.S.S.R., is quite different from either that of Asia or that of Africa and Latin America. Europe is facing a narrowing "demographic gap." Sooner or later, Europe may no more be threatened by a sharp imbalance originating from demographic trends. In addition, Europe has the advantage of possessing a highly developed technology and effective economic organization. In a shrinking and interrelated world such as the one of the 1960's, the population problem of Asia and parts of Africa and Latin America, far from being a regional problem, will inevitably become a problem of the world.

(9) *How great are the existing disparities in material well-being between the crucial areas and areas with highly developed economy?*

As far as level of education is concerned, for the period 1949–1955 nations with a literacy rate of 20-50 per cent, or under 20 per cent are found mainly in Africa, Asia, and South America. On the other hand, nations with a literacy rate of 50-80 per cent, or over 80 per cent are mainly in North America, Europe, Oceania, and U.S.S.R. (For details see Table XI.)

In 1949 Africa, Asia, and South America together con-

tained 65.8 per cent of the world population, but shared only 16.6 per cent of the world national income. North America, Europe, U.S.S.R., and Oceania represented 34.2 per cent of the world population but their share of the world national income was 83.4 per cent. As a result the per capita national income was extremely low in the former three regions, especially Asia. The per capita income of North America in 1949, $1,100, was 6.5 times as high as that of South America, 14.6 times as high as that of Africa and 22 times that of Asia. (For details see Tables XII and XIII.)

As far as food consumption is concerned, according to the report of Political and Economic Planning of London, 1955, 73 per cent of the world population in 1950 were underfed, of whom 7 per cent were in Europe (largely in Eastern and Southern Europe), 6 per cent in Latin America, 53 per cent in Asia, and 7 per cent in Africa. But the distribution of world population in 1950 in these regions was 23 per cent in Europe, including U.S.S.R., 6.5 per cent in Latin America, 55.3 per cent in Asia and 8.0 per cent in Africa. (For more information on per capita food consumption and requirement for selected nations, see Tables XIV and XV.)

(10) *How would rapid population growth impede the effort of nations in these crucial areas to raise their level of consumption?*

If the per capita national income of Europe in 1949, $380, were established as the goal for nations in Asia, Africa, and South America, these nations, as a group, would have to increase their national income by about 4 times in Africa, about 6.6 times in Asia, and 1.2 times in South America. Take Asia as an example. Assuming that the Asian nations as a group which had a per capita income

of $50 in 1949 will have a constant growth rate in national income of 5 per cent per year, it would take about forty-two years of constructive and hard work on their economic development program before the per capita income of Asia could reach the level attained by Europe in 1949—provided their population remained constant during the forty-two years following 1949. Since population in Asia will continue to grow rapidly, it would take many more years for Asian nations to reach that same goal.

On the basis of a population increase of approximately 4.5 million in 1950, India would have to generate a net capital formation of about $1.2 billion in that year just to keep the per capita income constant. It was estimated that the net capital formation of India in that year was probably below the level of $1.2 billion. Thus the fruit of economic development of 1950 was completely consumed by the increased population and no net improvement of per capita income was realized.

Since available capital for development was usually scarce in Asia, Africa, and South America, the rapid growth of population would deeply hamper or nullify the effort of these nations to close the gap of per capita consumption between them and the highly industrialized nations. (For details and explanations see Section B, Part V.)

(11) *Did food production win the race against population growth in recent years?*

For the world as a whole the increase in total food production was 2.0 per cent per annum from 1953–1954 to 1957–1958, as compared with an annual rate of population growth of 1.5 per cent for 1953–1957. Thus, for the past four years, the world food production has left a scanty margin of 0.5 per cent extra annually to improve the level of diet of the world's population, a level at which

about 70 per cent of the people are grossly underfed. But the per capita food production in the Far East, Latin America, and Oceania in 1957–1958 was still below the prewar average, while that in North America was much higher, and consequently has accumulated more and more surplus foods. Thus the result of the race was an uncomfortable one for the world as a whole as well as a greater gap of per capita food production among various regions of the world.

(12) *What would be the most realistic and farsighted approach to this overpopulation problem of the world of the 1960's?*

No matter how promising science and technology may be in bringing abundance to mankind in the distant future, it does not alter the fact that the practical economic accomplishments would ever lag behind what could be considered technically feasible, and the current race between food and population in many parts of the world will continue to be a highly uncomfortable one. It also does not alter the fact that the task of adequately feeding and clothing the present size of world population is tremendous, pressing, and yet unsolved, nor does it alter the fact that scores of millions of new inhabitants are being added to the population of this planet every year, which makes the unsolved task even more embarrassingly difficult. Moreover, one can hardly conceive of the irony that the millions of lives saved by modern medical technology on the one hand may be lost by starvation on the other hand if the population growth ever outstrips the food production. Thus the most realistic and farsighted approach to this problem is still the rapid reduction in birth rate, as soon as possible, in these crucial world regions. It seems that for a long time insufficient world-wide

attention has been devoted to this world problem. There is probably no field in which scientific research and public awareness are more urgently needed than in the field of world population growth, and none in which with timely action greater rewards in human welfare can be realized in the future.

Statistical Tables

TABLE I

ESTIMATES OF WORLD POPULATION AND ITS DISTRIBUTION, BY REGIONS, 1650-1957

Series of estimates and year	Estimated Population in Millions and Percentage of Population Contained in Each Continent													
	World Total		Africa		Northern America[c]		Latin America[d]		Asia (excl. USSR)		Europe and USSR		Oceania	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Carr-Saunders' estimates:[a]														
1650	545	100.0	100	18.3	1	0.2	12	2.2	327	60.0	103	18.9	2	0.4
1750	728	100.0	95	13.0	1	0.1	11	1.5	475	65.2	144	19.8	2	0.3
1800	906	100.0	90	9.9	6	0.7	19	2.1	597	66.9	192	21.2	2	0.2
1850	1,171	100.0	95	8.1	26	2.2	33	2.8	741	63.3	274	23.4	2	0.2
United Nations estimates:[b]														
1900	1,608	100.0	120	7.5	81	5.0	63	3.9	915	56.9	423	26.3	6	0.4
1920	1,810	100.0	140	7.7	117	6.5	91	5.0	967	53.4	486	26.9	9	0.5
1930	2,013	100.0	155	7.7	135	6.7	109	5.3	1,073	53.5	531	26.3	10	0.5
1940	2,246	100.0	172	7.7	146	6.5	131	5.8	1,213	54.0	572	25.5	11	0.5
1950	2,495	100.0	199	8.0	168	6.7	162	6.5	1,379	55.3	574	23.0	13	0.5
1957	2,795	100.0	225	8.0	189	6.8	192	6.9	1,556	55.7	618	22.1	15	0.5

a. Estimated numbers of population from *The Determinants and Consequences of Population Trends*, United Nations, New York, 1953, Table 2, p. 11. Certain adjustments in Carr-Saunders' estimates have been made by United Nations in order to render them comparable with United Nations series. A.M. Carr-Saunders, *World Population*, 1936, p. 42. Percentage figures were calculated by the author.

b. Estimated numbers of population for 1920-1950 from United Nations *Demographic Yearbook, 1957*, Table 2, p. 123; those for 1957 from *Demographic Yearbook, 1958*, Table 2, p. 104. The numbers are estimates of mid-year population. Percentage figures were calculated by the author.

c. For the period 1650-1900, U.S.A., Canada, Alaska, St. Pierre, and Miguelon; for the period 1920-1957, Bermuda and Greenland were added.

d. Middle America (Central America and the Islands of the Caribbean) and South America (the entire continent).

TABLE II

AVERAGE ANNUAL RATE OF GROWTH IN ESTIMATED WORLD POPULATION, BY REGION, 1650-1957

Period	Average annual rate of growth (per cent), Carr-Saunders—United Nations Series						
	World Total	Africa	Northern America	Latin America	Asia (excl. USSR)	Europe and USSR	Oceania
1900-1950							
1900-1950	0.59	0.77	1.85	1.85	0.28	0.70	2.05
1920-1930	1.07	1.02	1.44	1.82	1.61	0.89	1.06
1930-1940	1.11	1.04	0.79	1.86	1.24	0.74	0.96
1940-1950	1.06	1.47	1.42	2.15	1.29	0.04	1.68
1950-1957	1.63	1.77	1.70	2.45	1.74	1.07	2.23

World Total

1650-1950 — 0.51	1750-1800 — 0.44	1850-1900 — 0.64
1650-1750 — 0.29	1800-1850 — 0.51	1900-1950 — 0.88

Computed from data presented in Table I. Also see Table I for source and explanation. The formula used in computing the average annual rate of growth is presented below:

$\text{Log } P_2 = \text{Log } P_1 + n\,[\text{Log } (100 + r) - \text{Log } 100]$ (P_1 and P_2 refer to sizes of population in the first and the last years respectively of a given period; n refers to number of years included in a given period; r refers to the average annual rate of growth in percentage).

TABLE III

ESTIMATES OF WORLD POPULATION BY REGIONS, 1950-2000: MEDIUM ASSUMPTION[a] FOR 1975 AND 2000

Year	Estimated population in millions and percentage of population contained in each continent*																	
	World Total		Africa		Northern America[b]		Latin America[c]		Asia (excl. USSR		Europe and USSR		Europe (excl. USSR)		USSR		Oceania	
	Population	Per Cent	Population	Per Cent	Population	Per Cent	Population	Per Cent	Population	Per Cent	Population	Per Cent	Population	Per Cent	Population	Per Cent	Population	Per Cent
1950	2,497	100.0	199	8.0	168	6.7	163	6.5	1,380	55.3	574	23.0	393	15.7	181	7.3	13	0.5
1975	3,828	100.0	303	7.9	240	6.3	303	7.9	2,210	57.7	751	19.7	476	12.4	275	7.3	21	0.5
2000	6,267	100.0	517	9.4	312	5.0	592	9.4	3,870	61.8	947	15.1	568	9.1	379	6.0	29	0.5

Source: Estimated numbers of population from *The Future Growth of World Population*, United Nations, New York, 1958, Appendix C, Table I(A) and Table I(B), pp. 69-71. For 1950, only a single set of estimates was made; for 1975, United Nations identified the medium series with the high series for all regions other than Middle Africa where it is identified as the low series, and the Pacific Islands where only a single series of estimates has been made. Thus the medium totals for the African continent and for the world as a whole were obtained by adding low figures for Middle Africa to high figures for the other regions of Africa and of the world. Percentage figures were calculated by the author.

* Sum of figures rounded to the nearest million.

a. Medium assumption is the assumption that mortality will continue to decline at rates which now are normal and fertility will remain constant between 1950 and 1975, but decline at rates observed previously in some areas after 1975. Also, see Appendix 2.

b. U.S.A., Canada, Alaska, St. Pierre and Miguelon, Bermuda, and Greenland.

c. Middle America (Central America and the islands of the Caribbean) and South America (the entire continent).

TABLE IV

ESTIMATED PERCENTAGE INCREASE AND AVERAGE ANNUAL RATE OF GROWTH IN WORLD POPULATION, BY REGIONS, 1950-2000*
(Medium Assumption)[a]

Period	Percentage Population Increase								
	World Total	Africa	Northern America	Latin America	Asia (excl. USSR)	Europe and USSR	Europe (excl. USSR)	USSR	Oceania
1950-2000	151.0	159.8	85.7	263.2	180.4	65.0	44.5	109.4	123.1
1950-1975	53.3	52.3	42.9	85.9	60.1	30.8	21.1	51.9	61.5
1975-2000	63.7	70.6	30.0	95.4	75.1	26.1	19.3	37.8	38.1
	Average Annual Rate of Growth[b] (per cent)								
	World Total	Africa	Northern America	Latin America	Asia (excl. USSR)	Europe and USSR	Europe (excl. USSR)	USSR	Oceania
1950-2000	1.86	1.93	1.25	2.61	2.08	1.01	0.74	1.49	1.65
1950-1975	1.72	1.70	1.44	2.51	1.90	1.08	0.77	1.59	1.94
1975-2000	1.99	2.16	1.06	2.72	2.26	0.93	0.71	1.29	1.30

* Computed from data presented in Table III, also see Table III for source and explanation.

a. For explanation of Medium Assumption see footnote in Table II or Appendix 2.

b. For formula used in computing annual rate of growth, see footnote in Table II.

TABLE V

ESTIMATES OF THE POPULATION OF THE WORLD, CONTINENTS AND REGIONS,[a] 1950-2000, AND PERCENTAGE INCREASE IN 1950-1975 AND 1950-2000
(Medium Assumption)[b]

	Population (million)[c]			Increase (per cent)		Rank by percentage increase	
	1950	1975	2000	1950-1975	1950-2000	1950-1975	1950-2000
World total	2,497.0	3,828.0	6,267.0	53.3	151.0	....	....
Africa total	199.0	303.0	517.0	52.3	159.8	....	....
Northern Africa	42.7	76.4	147.0	78.9	244.3	4	3
Middle Africa	142.0	202.0	323.0	42.3	127.5	15	11
Southern Africa	13.9	24.4	47.1	75.5	238.8	5	4
North America total	219.0	339.0	510.0	54.8	132.9	....	....
Northern America	168.0	240.0	312.0	42.9	85.7	14	15
Central America	34.7	72.3	150.0	108.4	332.3	1	1
Caribbean	16.3	27.1	48.0	66.2	194.5	7	7
South America total	112.0	204.0	394.0	82.1	251.8	....	....
Tropical South America	84.4	163.0	339.0	93.1	301.7	2	2
Temperate South America	27.2	41.7	55.8	53.3	105.1	12	13

Asia total (excl. USSR)	1,380.0	2,210.0	3,870.0	60.1	180.4	....	....
Southwest Asia	63.3	116.0	206.0	83.2	225.2	3	5
Central South Asia	466.0	737.0	1,310.0	58.2	181.1	10	10
Southeast Asia	171.0	280.0	498.0	63.7	191.2	8	8
East Asia (without Japan)	595.0	958.0	1,700.0	61.0	185.7	9	9
Japan & Ryukyu Islands	83.6	117.0	153.0	40.0	83.0	16	16
Europe total (excl. USSR)	393.0	476.0	568.0	21.1	44.5	....	....
Northern & Western Europe	133.0	154.0	180.0	15.8	35.3	19	19
Central Europe	128.0	156.0	183.0	21.9	43.0	18	18
Southern Europe	132.0	166.0	206.0	25.8	56.1	17	17
Oceania total	13.1	21.0	29.4	60.3	124.4	....	....
Australia & New Zealand	10.2	16.0	20.8	56.9	103.9	11	14
Pacific Islands	2.9	5.0	8.6	72.4	196.5	6	6
Soviet Union total	181.0	275.0	379.0	51.9	109.4	13	12

Source: Estimated numbers of population from *The Future Growth of World Population,* United Nations, New York, 1958, Appendix C, Table I(A) and Table I(B), pp. 69-71. For 1950, only a single set of estimates was made. For 1975 and 2000, only medium estimates were presented. Figures of percentage increase and rank were estimated by the author.

a. The nations and territories included in each of the nineteen World Regions are presented in the Appendix section.

b. For explanation of medium assumption see footnote in Table III. Also see Appendix 2.

c. Rounded to two significant digits for the continents.

TABLE VI

POPULATION DENSITY (NUMBER OF PERSONS PER SQUARE KILOMETER OF LAND) IN NINETEEN REGIONS[a] OF THE WORLD IN 1950, AND IN 1975 AND 2000 ON MEDIUM ASSUMPTION[b]

	Area (Thousand Km²)	Persons per Km²			Rank in population density		
		1950	1975	2000	1950	1975	2000
World[c]	135,193	18.5	28.3	46.4	....	....	....
Africa	30,260	6.5	10.0	17.1	....	....	....
Northern Africa	5,820	7.3	13.1	25.3	13	11	11
Middle Africa	21,600	6.5	9.4	14.9	14	16	15
Southern Africa	2,840	4.9	8.6	16.6	17	17	14
North America	24,246	9.0	14.0	21.0	....	....	....
Northern America	21,500	7.8	11.2	14.5	12	14	17
Central America	2,510	13.8	28.8	59.8	9	9	9
Caribbean	236	69.1	114.8	203.4	5	4	3
South America	17,860	6.3	11.4	22.1	....	....	....
Tropical South America	13,700	6.2	11.9	24.7	16	13	12
Temperate South America	4,160	6.5	10.0	13.4	15	15	18
Asia (excl. USSR)	27,052	51.0	81.7	143.1	....	....	....
Southwest Asia	5,550	11.4	20.9	37.1	10	10	10
Central South Asia	5,140	90.7	143.3	254.9	3	3	2
Southeast Asia	4,490	38.1	62.4	110.9	8	8	7
East Asia (Without Japan)	11,500	51.7	83.3	147.8	7	6	5
Japan & Ryukyu Islands	372	224.7	314.5	411.3	1	1	1

Europe (excl. USSR)	4,920	80.0	96.7	115.4	....	....	....
Northern & Western Europe	2,250	59.1	68.4	80.0	6	7	8
Central Europe	1,010	126.7	154.4	181.0	2	2	4
Southern Europe	1,660	79.5	100.0	124.1	4	5	6
Oceania	8,555	1.5	2.4	3.4	....	....	....
Australia & New Zealand	7,970	1.3	2.0	2.6	19	19	19
Pacific Islands	585	4.9	8.5	14.7	18	18	16
Soviet Union	22,300	8.1	12.3	17.0	11	12	13

Source: Estimated numbers of population from *The Future Growth of World Population,* United Nations, New York, 1958, Appendix C, Table I(A) and Table I(B), pp. 69-71. For 1950, only a single set of estimates was made. For 1975 and 2000 only medium estimates were presented. Land area in square kilometers from the same above source, Table 8, p. 25. Population density figures and rank numbers were estimated by the author.

a. The nations and territories included in each of the nineteen World regions are presented in the Appendix section.

b. For explanation of medium assumption see footnote in Table III. Also see Appendix 2.

c. Excluding the Antarctic continent.

TABLE VII

LAND AREAS (IN SQUARE KILOMETERS), EXPECTED CHANGES IN POPULATION GROWTH AND POPULATION DENSITY IN FOUR GROUPS[a] OF WORLD REGIONS, 1950-2000

(Population for 1975 and 2000 on Medium Assumption)

	Land Area		Population as per cent of World total			Population increase		Population density (persons per Km²)		
	Km² (Thousands)	Per cent of World total	1950	1975	2000	1950-1975 Per cent	1950-2000 Per cent	1950	1975	2000
World total*	135,193	100.0	100.0	100.0	100.0	53.3	151.0	18.5	28.3	46.4
I. High population density in 1950 with expected fast rate of growth for 1950-2000.	21,366	15.8	50.0	52.3	56.7	60.4	185.0	58.4	93.7	166.4
II. Low population density in 1950 with expected fast rate of growth for 1950-2000.	31,005	22.9	9.7	11.9	14.3	90.0	271.1	7.8	14.7	29.0
III. High population density in 1950 with expected slow rate of growth for 1950-2000.	5,292	3.9	19.1	15.6	11.6	24.4	51.1	90.0	112.0	136.4
IV. Low population density in 1950 with expected slow rate of growth for 1950-2000.	77,530	57.4	21.2	20.2	17.4	46.6	106.4	6.8	9.9	14.1

Source: Computed from data in Tables V and VI.

* Excluding the Antarctic continent.

a. The nineteen World regions are classified into the 4 groups of World regions by the use of the following arbitrary criteria: (1) population density above or below the World population density in 1950, and (2) the percentage increase of population during the period 1950-2000 above or below the world average for the same period on medium assumption. Thus Group I includes Caribbean, Central South Asia, Southeast Asia, East Asia (without Japan). Group II includes Northern Africa, Southern Africa, Central America, Tropical South America, Southwest Asia, and Pacific Islands. Group III includes Japan & Ryukyu Islands, Northern & Western Europe, Central Europe, and Southern Europe. Group IV includes Middle Africa, Northern America, Temperate South America, Australia & New Zealand, and USSR.

TABLE VIII

AVERAGE RATES OF BIRTH, DEATH AND NATURAL INCREASE OF WORLD POPULATION, BY REGIONS, 1936-1938 AND 1946-1948

World regions	1936-1938			1946-1948		
	Birth rates	Death rates	Natural increase	Birth rates	Death rates	Natural increase
World	34-38	24-27	8-13	35-37	22-25	11-14
Africa	40-45	30-35	7-13	40-45	25-30	12-18
America						
Northern America	17	11	6	25	10	15
Latin America	40-45	20-25	17-23	40	17	23
Asia (excl. USSR)						
Near East	40-45	30-35	7-13	40-45	30-35	7-13
South-Central Asia	40-45	30-35	7-13	40-45	25-30	12-18
Japan	28	17	11	31	15	16
Far East (excl. Japan)	40-45	30-35	7-13	40-45	30-35	7-13
Europe (incl. USSR)						
North-West-Central Europe	17	13	4	19	12	7
Southern Europe	23	16	7	23	12	11
Eastern Europe (incl. USSR)	30-40	17-21	11-15	28	18	10
Oceania	20	11	9	28	12	16

Source: *Population Bulletin, No. 1*, December 1951, United Nations, Table III, p. 3. Due to the available information for some of the regions were neither complete nor reliable, United Nations Population Division prepared to present the vital rates in range instead of a single figure.

TABLE IX

ANNUAL AVERAGE RATES OF BIRTH, DEATH, AND NATURAL INCREASE OF WORLD POPULATION, BY REGIONS, 1952-1956
(Birth and Death Rates per 1000 Population)

WORLD REGIONS[c]	Annual average for the period, 1952-56		
	Birth rates	Death rates	Natural increase[a]
World	34	18	1.6
Africa			
Northern Africa	42	28	1.7
Tropical & Southern Africa	50	33	1.8
America			
Northern America	25	9	1.7
Middle America	42	16	2.7
South America	39	17	2.4[b]
Asia			
Southwest Asia	42	22	2.5[b]
Central South Asia	40	27	1.4[b]
Southeast Asia	44	28	1.8
East Asia	35	16	1.6[b]
Europe			
Northern & Western Europe	18	11	0.6
Central Europe	19	11	0.9
Southern Europe	21	10	0.9[b]
Oceania	25	9	2.3[b]
USSR	26	9	....[c]

Source: United Nations *Demographic Yearbook, 1957*, p. 1.

a. Calculated by compound interest formula.

b. This rate reflects the combined effect of natural increase and migration.

c. "...." indicates lack of adequate information.

TABLE X

PROJECTED CHANGES IN THEORETICAL RATES OF BIRTH, DEATH AND NATURAL INCREASE OF WORLD POPULATION, BY REGIONS, 1950-1975

(On Medium Assumptions[a] for 1975)

World Continent	1950			1975		
	Birth Rate	Death Rate	Natural Increase	Birth Rate	Death Rate	Natural Increase
World	39	25	14	37	17	20
Africa	47	33	14	46	29	17
Northern America	22	9	13	21	9	12
Latin America	40	19	21	40	12	28
Asia	46	33	13	43	20	23
Europe (excl. USSR)	20	9	11	18	10	8
Oceania	26	12	14	28	10	16
USSR	25	7	18	22	7	15

Source: United Nations *The Future Growth of World Population,* 1958, Table 12, p. 32.

a. Medium assumption is the assumption of constant fertility and declining mortality for all regions in the world except the region of Middle Africa where constant fertility and mortality are assumed. Birth rates and death rates in the Caribbean and the Pacific are assumed to be the same as the average of the Latin American regions excluding Caribbean.

Also see Appendix 2 for the reason for using medium assumption.

TABLE XI

DISTRIBUTION OF 137 NATIONS AND TERRITORIES ACCORDING TO THE PERCENTAGE OF LITERATE POPULATION FIFTEEN YEARS OF AGE AND OVER, BY REGION, 1949-1955

Regions	Number of nations and territories with literacy percentage of			
	Over 80	50-80	20-50	Under 20
Northern Africa	....[a]	....	1	9
Tropical & Southern Africa	....	3	10	16
Northern America	2	....	....	....
Middle America	1	9	5	1
South America	3	6	3	....
East, South Central, & Southeast Asia	1	6	5	12
Southwest Asia	1	1	3	6
Europe	19	7	....	....
Oceania	3	1	....	2
USSR	1	....	....	....
Total	31	33	27	46

Source: *Report On the World Social Situation,* United Nations, 1957, p. 65.

a. "...." indicates none.

TABLE XII

POPULATION, NATIONAL INCOME[a] PRODUCED AND PER CAPITA INCOME OF WORLD CONTINENTS, 1949

Continent	Population[b]		National Income		
	Number (Thousand)	As per cent of World Total	Value in U.S. Dollars (Billion)	As per cent of World Total	Per capita National Income in U.S. Dollars
Africa	197,881	8.3	14.0	2.6	75
Asia	1,253,514	53.0	58.0	10.5	50
South America	107,519	4.5	18.0	3.5	170
North America	213,316	9.0	237.0	43.6	1,100
Europe	392,789	16.6	148.5	27.3	380
USSR	193,000	8.1	59.5	11.0	310
Oceania	12,434	0.5	7.0	1.5	560
World Total	2,370,453	100.0	542.0	100.0	230

Source: United Nations *National Income and Its Distribution in Under-Developed Countries,* Statistical Papers, Series E, No. 3, 1951, p. 3.

a. The term refers to the national income produced within the country or the net geographical product at factor cost. It includes income which is paid to foreign investors holding assets in the country concerned, but excludes income which is derived from foreign assets owned by the residents of that country. This term does not refer to the more usual concept of national income of residents or net national income at factor cost.

b. Refers to the population of 1946.

TABLE XIII

ESTIMATES OF AVERAGE ANNUAL PER CAPITA NET NATIONAL PRODUCT[a] OF FIFTY-TWO COUNTRIES FOR 1952-1954
(In U. S. Dollars)

Continents	Per Capita Net National Products of Countries (In U.S. Dollars)				
	Under 250	250-499	500-749	750-1,000	Above 1,000
Africa	Uganda (50) Kenya (60) Belgian Congo (70) Rhodesia & Nyasaland (100) Egypt (120)	Union of South Africa (300)			
Asia	Burma (50) India (60) Pakistan (70) Korea (70) Thailand (80)[b] Philippines (150) Japan (190) Turkey (210) Ceylon (110)	Lebanon (260) Malaya (310)[b] Israel (470)			
America	Peru (120) Paraguay (140) Honduras (150) Guatemala (160) Jamaica (180)[c] Mexico (220) Brazil (230)	Panama (250) Columbia (250) Cuba (310) Chile (360) Argentina (460)	Venezuela (540)[b]		Canada (1,310) U.S. (1,870)
Europe	Portugal (200) Greece (220)	Italy (310) Austria (310) Ireland (410)	Netherlands (500) Germany (510) Finland (670) Norway (740) France (740)	Denmark (750) Iceland (780) United Kingdom (780) Belgium (800) Luxembourg (890) Sweden (950)	Switzerland (1,010)
Oceania				Australia (950) New Zealand (1,000)	

Source: United Nations *Per Capita National Product of Fifty-five Countries, 1952-1954,* Statistical Papers, Series E, No. 4, 1957, Table 1, p. 7.

a. Refers to the per capita net production of goods and services produced at factor cost.

b. For 1952 and 1953.

c. For 1952.

TABLE XIV

CALORY SUPPLY PER CAPITA PER DAY AS COMPARED WITH THE CALORY REQUIREMENTS PER CAPITA PER DAY, FOR SELECTED COUNTRIES, BY REGIONS, IN RECENT YEARS

Country	Estimated calories requirement per capita per day	Calories supplies per capita per day		Calories supplies per capita per day above (+) or below (−) requirements	
		Early post-war period	Recent years	Early post-war period	Recent years
Far East					
India	2,250	1,700	1,850	−24.4	−17.8
Japan	2,330	2,100	2,160	− 9.9	− 7.3
Pakistan	2,300	2,020	2,180	−12.2	− 5.2
Philippines	2,230	1,960	1,960	−12.1	−12.1
Africa & Near East					
Egypt	2,390	2,290	2,380	− 4.2	− 0.4
Turkey	2,440	2,480	2,670	+ 1.6	+ 9.4
Union of South Africa	2,400	2,520	2,650	+ 5.0	+10.4
Latin America					
Argentina	2,600	3,190	2,840	+22.7	+ 9.2
Brazil	2,450	2,340	2,360	− 4.5	− 3.7
Chile	2,640	2,360	2,490	−10.6	− 5.7
Cuba	2,460	2,740	.....[a]	+11.4	.....
Peru	2,540	1,920	2,080	−24.4	−18.1
Uruguay	2,570	2,580	2,810	+ 0.4	+ 9.3
Venezuela	2,440	2,160	2,280	−11.5	− 6.6
Europe					
Denmark	2,750	3,160	3,280	+14.9	+11.9
France	2,550	2,770	2,795	+ 8.6	+11.0
Greece	2,390	2,510	2,520	+ 5.0	+10.5
Italy	2,440	2,340	2,595	− 5.1	+10.6
Netherlands	2,630	2,960	2,910	+12.5	+11.1
Switzerland	2,720	3,150	3,075	+15.8	+11.3
United Kingdom	2,650	3,100	3,140	+16.9	+11.8
Yugoslavia	2,630	.....	2,710	.....	+10.3
North America					
U.S.A.	2,640	3,130	3,070	+18.5	+11.6
Oceania					
Australia	2,620	3,160	3,040	+20.6	+11.6

Source: *Report On the World Social Situation,* United Nations, 1957, Appendix C, p. 61.

a. "...." indicates adequate information lacking.

TABLE XV

PER CENT SUPPLY OF CALORIES PER CAPITA PER DAY DERIVED FROM CEREALS AND STARCHY FOODS, FOR SELECTED COUNTRIES

	Per cent of calories per capita per day derived from cereals and starchy foods		
	Prewar years	1948/49 to 1950/51	1953/54 to 1954/55
Far East			
India	69[a]	67	69
Japan	77	78	71
Pakistan	....[b]	72	79
Philippines	67	....	74
Africa and Near East			
Egypt	72	72	72
Turkey	76	74	73
Union of South Africa	67	59	58
Latin America			
Argentina	44	45	41
Brazil	48	49	52
Chile	61	62	59
Cuba	49	48	....
Peru	64	66	65
Uruguay	40	35	40
Venezuela	....	46	48
Europe			
Denmark	33	39	34
France	51	51	47
Greece	61	62	58
Italy	65	65	60
Netherlands	44	43	37
Switzerland	39	41	37
United Kingdom	35	39	33
Yugoslavia	76	80	72
North America			
U.S.A.	32	27	26
Oceania			
Australia	34	33	31

Source: *The State of Food And Agriculture, 1957,* Food And Agriculture Organization, United Nations, Rome, 1957, Annex Table 12, p. 166.

a. Includes Pakistan.

b. "...." indicates information lacking.

TABLE XVI

INDEXES OF VOLUME OF TOTAL FOOD PRODUCTION AND PER CAPITA FOOD PRODUCTION,[a] BY REGIONS, PREWAR PERIOD—1957/58

(Average 1948/49-1952/53 = 100)

	Total food production					Per capita food production[a]				
	Average 1934-38	Average 1948/49 and 1949/50	1953/54	1956/57	1957/58 (preliminary)	Average 1934-38	Average 1948/49 and 1949/50	1953/54	1956/57	1957/58 (preliminary)
Far East (excl. China)	96	99	111	119	118	116	101	106	109	106
Near East	84	91	121	128	132	102	94	113	112	113
Africa	80	94	113	121	118	97	97	106	109	104
Latin America	79	95	109	122	121	106	98	101	106	103
Western Europe	93	91	115	116	117	102	92	112	111	111
North America	71	98	107	115	112	85	100	101	103	99
Oceania	90	101	107	107	103	108	106	100	93	87
World[b]	....	96	110	119	119	105	95	105	108	106

Source: *The State of Food And Agriculture, 1957,* Food and Agriculture Organization, United Nations, Rome, 1957, Table II-2, p. 12; *The State of Food and Agriculture, 1958,* Table II-3, p. 12.

a. Indexes of per capita food production do not accurately represent the net capita food supplies. This is due to the fact that per capita food supplies in different regions are not only dependent on per capita food production in the region, but also on the foreign trade and stock changes in food in the region.

a. Including estimates for the USSR, Eastern Europe, and China.

Appendix

1

The delineation of the nineteen world regions below strictly follows the practice of the United Nations Population Branch. Countries and territories included in each of the world regions are as follows:

a. *Northern Africa.* Algeria, Ceuta and Melilla, Egypt, Libya, Morocco, Spanish West Africa, and Tunisia.

b. *Middle Africa.* Angola, Belgian Congo, Cameroons (British Admin.), Cameroons (French Admin.), Cape Verde Islands, Comoro Islands, Empire of Ethiopia, French Equatorial Africa, French Somaliland, Togoland (French Admin.), French West Africa, Gambia, Ghana, Kenya, Liberia, Madagascar, Mauritius, Mozambique, Nigeria, Portuguese Guinea, Reunion, Rhodesia and Nyasaland, Ruanda-Urundi, St. Helena, Sao Tome and Principe, Seychelles, Sierra Leone, Somaliland (Italian Admin.), Somaliland Protectorate, Spanish Guinea, Sudan, Tanganyika, Uganda, and Zanzibar and Pemba.

c. *Southern Africa.* Basutoland, Bechuanaland, Southwest Africa, Swaziland, and Union of South Africa.

d. *Northern America.* Alaska, Bermuda, Canada, Greenland, St. Pierre and Miquelon, and U.S.A.

e. *Central America.* British Honduras, Canal Zone, Costa Rica, El Salvador, Guatemala, Honduras, Mexico. Nicaragua, and Panama.

f. *Caribbean.* British West Indies, Cuba, Dominican Republic, Guadeloupe, Haiti, Martinique, Netherlands, Antilles, Puerto Rico, and Virgin Islands (U.S.A.).

g. *Tropical South America.* Bolivia, Brazil, British Guiana, Colombia, Ecuador, French Guiana, Peru, Surinam, and Venezuela.

h. *Temperate South America.* Argentina, Chile, Falkland Islands, Paraguay, and Uruguay.

i. *Southwest Asia.* Aden Colony and Protectorate, Bahrain, Cyprus, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Muscat and Oman, Ghaza Strip (Palestine), Qatar, Saudi Arabia, Syria, Trucial Oman, Turkey, and Yemen.

j. *Central South Asia.* Afghanistan, Bhutan, Ceylon, India, Maldive Islands, Nepal, Pakistan, and Portuguese India.

k. *Southeast Asia.* British Borneo, Burma, Cambodia, Indonesia, Laos, Malaya, Philippines, Portuguese Timor, Singapore, Thailand, Viet-Nam, and West New Guinea.

l. *East Asia (without Japan).* China (mainland), China (Taiwan), Hongkong, Korea, Macao, and Mongolian People's Republic.

m. *Japan area.* Japan and Ryukyu Islands.

n. *Northern and Western Europe.* Belgium, Channel Islands, Denmark, Finland, France, Iceland, Isle of Man, Luxembourg, Monaco, Netherlands, Norway, Sweden, and United Kingdom.

o. *Central Europe.* Austria, Czechoslovakia, Germany, Hungary, Liechtenstein, Poland, Saar, and Switzerland.

p. *Southern Europe.* Albania, Andorra, Bulgaria, Gibraltar, Greece, Italy, Malta and Gozo, Portugal, Rumania, San Marino, Spain, the Vatican, and Yugoslavia.

q. *Australia and New Zealand.*

r. *Pacific Islands.* American Samoa, British Solomon Islands, Cook Islands, Fiji, French Oceania, Gilbert and Ellice Islands, Guam, Hawaii, Nauru, New Caledonia, New Guinea (Australian admin.), New Hebrides, Niue, Norfolk Island, Pacific Islands (U.S. admin.), Papua, Tokelau Islands, Tonga, and Western Samoa.

s. *U.S.S.R.*

2

Reasons for using medium assumptions figures for world population in 1975 and 2000.

According to the Population Branch of the United Nations, the estimates of the future world population were based on the following three assumptions:

a. *High assumptions.* Assumptions in which the mortality will continue to decline at rates which are now considered as normal and the fertility will remain constant until the year 2000.

b. *Medium assumptions.* Assumptions in which the mortality will continue to decline at rates which are considered as normal and the fertility will decline at rates observed previously in some areas after 1975. In other words, up to 1975 medium assumptions actually identify with high assumptions for all regions except Middle Africa, where they identify with low assumptions. After 1975 medium assumptions are different from both high and low assumptions for all regions except that of the Pacific Islands, where no separate assumptions have been made.

c. *Low assumptions.* Assumptions in which mortality will continue to decline at rates which are now considered as normal, and the fertility will decline continuously at rates observed previously in some areas.

According to the Population Branch, the future world population in 1975 would seem, most likely, to fall slightly short of the high estimates and that in 2000 to lie anywhere in the range between the high and medium estimates. Considering the limited space available in this volume, only one of the three above assumptions could be presented here. The author thus chose to present the medium assumption figures.

Notes

1. Includes U.S.A., Canada, Alaska, St. Pierre and Miquelon, Bermuda, and Greenland.

2. Includes Central America and the islands of the Caribbean.

3. Julian Huxley, "Population and Human Destiny," *Harper's Magazine,* 201 (September, 1950), pp. 38-46.

4. Bennet, M. K., *The World's Food,* Harper, 1954, p. 7.

5. See Appendix for explanation of the medium estimates.

6. Thus the regions in Table VI with population density of more than 18.5 persons per square kilometer in 1950 are classified as "high density" group while those regions with population density lower than that figure are classified as "low density" group. Similarly, the regions, in Table V, with the expected population increase of over 151.0 per cent for the period 1950–2000 are considered as "fast growth" group while those with an increase of less than 151.0 per cent are "slow growth" groups.

7. The Population Branch of the United Nations, in one of their studies, had classified the nineteen world regions into four similar groups of regions. Owing to the criteria for grouping used in that study being different from the criteria being used here, Middle Africa was included in the group of "low density, rapid growth" in that study while that region is here included in the group, "low density, slow rate of growth." Despite the differences in criteria used, the findings in both studies are quite similar. See *The Future Growth of World Population,* United Nations, 1958, pp. 26-27 for details.

8. Except Middle Africa and Temperate South America.

9. Demographic gap occurs whenever the birth rate and death rate change at different speeds. It is a result of any of the four combinations: (1) birth rate increases while death rate remains the same, (2) birth rate increases while death rate drops, (3) birth rate remains the same while death rate drops, and (4) death rate drops faster than birth rate. The

third and the four combinations explain the rapid growth of population in these regions in recent years.

10. Simple average of the crude death rate figures in *Demographic Yearbook*, 1957, United Nations, pp. 192-93.

11. Thompson, Warren S., *Plenty of People*, Ronald Press, 1948, p. 70.

12. The demographic gap here is a result of the fourth combination described in footnote 9.

13. *The Determinants and Consequences of Population Trends,* United Nations, 1953, pp. 185-86.

14. The figures of total national income or per capita national income used here for international comparison are subject to serious reservation because the estimates in domestic currency for some countries are, at best, a crude approximation. In addition, the institutional arrangements vary from country to country, and the conversion of domestic currency into U.S. dollars would obviously add to the difficulties of accurate international comparison. These figures, however, would reflect broadly the disparity between the more developed nations and the less developed nations.

15. Anderson, Samuel W., "Population Growth and Capital Formation In Underdeveloped Countries," *Proceedings of the World Population Conference,* 1954, United Nations, Vol. V, pp. 626-34.

16. Political And Economic Planning *World Population And Resources,* George Allen & Unwin, London, 2nd. impression in 1956, p. 44.

17. Refer to the average annual increase for the period 1952/53–1953/54 to 1956/57–1957/58.

18. Japan's overpopulation problem is more like that of Europe than that of Asia in general.

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